

# Chapter P

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“Tell me and I forget.  
Teach me and I remember.  
Involve me and I learn.”

- Benjamin Franklin

(1) Put the following steps in the correct chronological order.

- |                            |                                    |
|----------------------------|------------------------------------|
| 1 Explore the data.        | 5 Design a study and collect data. |
| 2 Formulate conclusions.   |                                    |
| 3 Look back and ahead.     | 6 Draw inferences beyond the data. |
| 4 Ask a research question. |                                    |

A  $1 \rightarrow 5 \rightarrow 4 \rightarrow 3 \rightarrow 2 \rightarrow 6$

B  $1 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 2 \rightarrow 3$

C  $4 \rightarrow 5 \rightarrow 1 \rightarrow 6 \rightarrow 2 \rightarrow 3$

D  $4 \rightarrow 5 \rightarrow 2 \rightarrow 1 \rightarrow 6 \rightarrow 3$

E None of the above.

(2) Match the following terms with their correct definitions.

- 1 A recorded characteristic on the elements of data
- 2 An individual entity on which data is recorded
- 3 A pattern of value/category outcomes

A 1 = observational unit, 2 = distribution, 3 = variable

B 1 = distribution, 2 = variable, 3 = observational unit

C 1 = variable, 2 = distribution, 3 = observational unit

D 1 = variable, 2 = observational unit, 3 = data

E None of the above.

**(3) Select the correct pairing of observational unit (OU) with variable in the following statement.**

How much did a typical American consumer spend on Christmas presents in 2012?

- A OU = Christmas presents, Variable = Number of people
- B OU = dollars spent, Variable = Number of family members
- C OU = dollars spent, Variable = Social class
- D OU = consumers, Variable = dollars spent on Christmas presents in 2012
- E None of the above.

An article in a 2006 issue of the Journal of Behavioral Decision Making reports on a study involving 47 undergraduate students at Harvard. All of the participants were given \$50, but some (chosen at random) were told that this was a “tuition rebate,” while the others were told that this was “bonus income.” After one week, the students were contacted again and asked how much of the \$50 they had spent and how much they had saved. Researchers wanted to know whether those receiving the “rebate” would tend to save more money than those receiving the “bonus”.

**(4) Select the correct pairing:**

- A OU = students, Number of variables = 1
- B OU = dollars spent, Variable = students
- C OU = dollars spent, Variable = Rebate/Bonus
- D OU = students, Only variable = dollars spent
- E None of the above.

Do college students who pull all-nighters tend to have lower grade point averages than those who do not pull all-nighters?

**(5) Select the correct pairing:**

- A** OU = GPA, Only variable = College students
- B** OU = college students, Variables = one quantitative, one categorical
- C** OU = amount of sleep, Only variable = GPA
- D** OU = students who pull all-nighters vs students who don't, Only variable = receiving low GPA
- E** None of the above.

Statistical evidence played an important role in the murder trial involving Kristen Gilbert, a nurse who was accused of murdering hospital patients by giving them fatal doses of heart stimulant. The following table summarizes eighteen months of data collected from the hospital where she worked. The data recorded included whether Gilbert was working during an eight-hour shift and whether a death occurred on the shift:

|                   | Gilbert On Shift | Gilbert Not On | <b>Total</b> |
|-------------------|------------------|----------------|--------------|
| Death Occurred    | 40               | 34             | 74           |
| No Death Occurred | 217              | 1350           | 1567         |
| <b>Total</b>      | 257              | 1384           | 1641         |



(6) What are the observational units?

A Deaths

B Hospitals

C Nurses

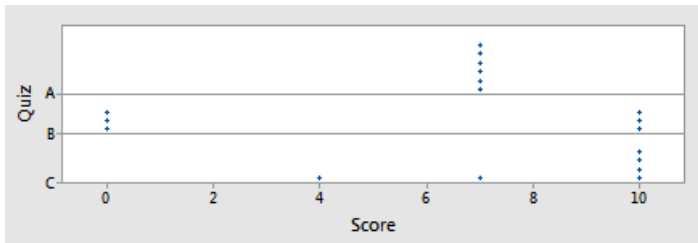
D Patients

E Shifts

(7) One of the variables of interest in this study is whether or not Kristen Gilbert was working, what is the other variable and is it quantitative or categorical?

- A If a death occurred on a shift or not, categorical
- B How many deaths occurred, quantitative
- C The proportion of shifts with a death, quantitative
- D Whether a patient lived or died before leaving the hospital, categorical
- E Whether or not more patients died while Gilbert was working, categorical

Consider three distributions of scores for a class of six students.

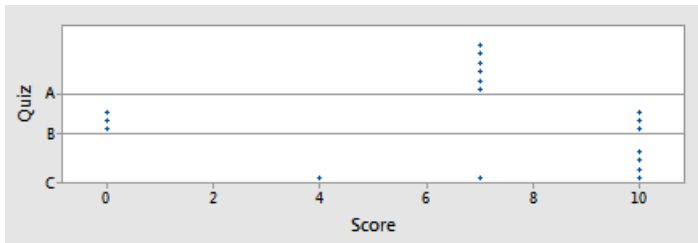


(8) Without doing any calculations, decide how the means of the three quizzes compare.

- A  $Mean(A) = Mean(B) = Mean(C)$
- B  $Mean(B) < Mean(C) < Mean(A)$
- C  $Mean(B) < Mean(A) = Mean(C)$
- D  $Mean(B) < Mean(A) < Mean(C)$
- E None of the above.

## Center and Variability

Consider three distributions of scores for a class of six students.



(9) Without doing any calculations, decide how the standard deviations (SD) of the three quizzes compare.

- A  $SD(A) < SD(B) < SD(C)$
- B  $SD(A) < SD(C) < SD(B)$
- C  $SD(B) < SD(C) < SD(A)$
- D They are all about the same
- E None of the above.

## Key Terms to Understand in Section 1.1

- Statistical significance
- Sample and statistic
- Parameter
- Chance model
- Six Steps of the Statistical Investigation
- 3S Strategy for Measuring Strength of Evidence